P11B-2078: The Colour and Stereo Surface Imaging System (CaSSIS) on ExoMars Trace Gas Orbiter (TGO): Building on orbital imaging from MRO and Mars Express

ABSTRACT

Monday, 14 December 2015
08:00 - 12:20
Moscone South - Poster Hall

TGO launch is expected in early 2016. Why do we need more orbital imaging of Mars given the near-global coverage by the High Resolution Stereo Camera (HRSC) on Mars Express and the Context Camera (CTX) on Mars Reconnaissance Orbiter (MRO), plus the very high-resolution coverage by MRO's High Resolution Imaging Science Experiment (HiRISE)? CaSSIS extends the monitoring of past missions to future years to track longer-term changes, and provides contemporaneous imaging of regions that may have unique signatures such as trace gases detected by other experiments on TGO. CaSSIS will provide the highest resolution (~4.6 m/pixel) coverage of Mars everywhere except the ~2% of Mars' surface covered by HiRISE (and only ~0.5% in colour or stereo) and another few percent covered by the Mars Orbital Camera (MOC). Although CTX has a similar imaging scale (~5.5 m/pixel), it does not provide colour images and useful stereo coverage is ~10% of Mars; CaSSIS uses a rotation mechanism to acquire along-track stereo with matching illumination of the surface. HRSC has provided >90% global stereo and colour coverage, but the highly elliptical orbit and wide-angle optics result in >10 m/pixel scale. Also, the HRSC images are acquired at different emission and phase angles per colour. The 72 degree inclined orbit of TGO means that it rotates through all local times of day several times per Mars season, so CaSSIS will have the unique ability to monitor how surfaces change with time of day as well as season, which could prove important to understanding recurring slope lineae (RSL) and frost distributions. This orbit also provides more opportunities to monitor the middle latitudes, for example to find new impacts that expose shallow clean ice. The 4 CaSSIS colour bands include matches to the 3 HiRISE colour bands, to extend monitoring of key sites. In summary, CaSSIS is by design complementary to past/continuing orbital imaging

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